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10/500,317	06/28/2004	Shinichi Kawasaki	12088/019001	9863
22511	7590	01/17/2008	EXAMINER	
OSHA LIANG L.L.P. 1221 MCKINNEY STREET SUITE 2800 HOUSTON, TX 77010			ZERVIGON, RUDY	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/500,317	Applicant(s) KAWASAKI ET AL.	
	Examiner Rudy Zervigon	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 60-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 60-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 November 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 60-69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 60-69 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: Applicant's claimed "open direction of the cruciform directions" is unclear in context and are thus incomplete for omitting essential structural cooperative relationships of elements.

4. The term "open direction of the cruciform directions" in claim 60 is a relative term which renders the claim indefinite. The term "open direction of the cruciform directions" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

5. Claim 60 recites the limitation "said gas passage". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 60 and 61 are rejected under 35 U.S.C. 102(a,e) as being anticipated by Denes, Ferencz S. et al. (US 20030129107 A1). Denes teaches a plasma (100; Figure 1,2; [0025]-[0026]) surface processing apparatus (Figure 2; [0025]-[0026]) for processing a surface of a material to be processed (200; Figure 2; [0025]-[0026]) with a processing gas plasmatized (100; Figure 1,2; [0025]-[0026]) under an electric field, said apparatus (Figure 2; [0025]-[0026]) having an electrode structure (Figure 4; [0041]) having a gas passage (142; Figure 1) through which said processing gas is passed along a passage direction (142; Figure 1) and for generating said electric field in said gas passage (142; Figure 1), said electrode structure (Figure 4; [0041]) comprising:

an elongate metallic first electrode body (416; Figure 4; [0041]) extending in a longitudinal direction (width of 140/146; Figure 1) orthogonal to said passage direction (142; Figure 1) and having an elongate outer first plasma generating surface (outer surfaces of 406, 402; Figure 4; [0041]) extending in said longitudinal direction (width of 140/146; Figure 1); an elongate metallic second electrode body (any other 406; Figure 1,4; [0041] - claim 63 requires "separation") extending in said longitudinal direction (width of 140/146; Figure 1) and arranged in parallel (Figure 4) with said first electrode body (416; Figure 4; [0041]) in an arranging direction (axis along 116; Figure 1) orthogonal to said longitudinal direction (width of 140/146; Figure 1) and to said gas passage direction (142; Figure 1), said second electrode body (any other 406; Figure 1,4; [0041] - claim 63 requires "separation") having an elongate outer second plasma

generating surface (outer surfaces of any other 406, 402; Figure 4; [0041]) extending in said longitudinal direction (width of 140/146; Figure 1) and facing said first plasma generating surface (outer surfaces of 406, 402; Figure 4; [0041]) in said arranging direction (axis along 116; Figure 1), said electric field being generated between said first (outer surfaces of 406, 402; Figure 4; [0041]) and second plasma generating surfaces (outer surfaces of any other of 406, 402; Figure 4; [0041]); and an elongate dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015]) first case body (406+422+416; Figure 4; [0041]) extending in said longitudinal direction (width of 140/146; Figure 1) in parallel (Figure 4) with said first and second electrode bodies (416; Figure 4; [0041]), said dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015]) first case body (406+422+416; Figure 4; [0041]) being formed a cross section (Figure 4) orthogonal to said longitudinal direction (width of 140/146; Figure 1) into a U-shape (compare Applicant’s 57a; Figure 19 to U-shaped 416 into page) so that said first case body (406+422+416; Figure 4; [0041]) has a first opening (142; Figure 1) which is opened toward an open direction (142; Figure 1) of the cruciform directions (presumed to be orthogonal axis as established in Figure 1) composed of said gas passage direction (142; Figure 1) and said arranging direction (axis along 116; Figure 1), said first electrode body (416; Figure 4; [0041]) being received in said dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015]) first case body (406+422+416; Figure 4; [0041]) so that said first plasma generating surface (outer surfaces of 406, 402; Figure 4; [0041]) is contacted with an inner peripheral surface of said first case body (406+422+416; Figure 4; [0041]), said second electrode body (any other 406; Figure 1,4; [0041] - claim 63 requires “separation”) being disposed outside (412; Figure 4) of said dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015]) first case body

(406+422+416; Figure 4; [0041]) in said arranging direction (axis along 116; Figure 1) without aiming toward said first opening (142; Figure 1), said gas passage (142; Figure 1) being formed between said dielectric ("insulating layer" - "ceramic coating"; Figure 3,4; [0015]) first case body (406+422+416; Figure 4; [0041]) and said second electrode body (any other 406; Figure 1,4; [0041] - claim 63 requires "separation"), an end part (422; Figure 4) on a side of said first opening (142; Figure 1) of said first case body (406+422+416; Figure 4; [0041]) being protruded in said open direction (142; Figure 1) relative to said first electrode body (416; Figure 4; [0041]), as claimed by claim 60

Denes further teaches:

- i. An electrode structure (Figure 4; [0041]) according to claim 60, further comprising: a elongate lid (418; Figure 4; [0041]) made of a solid dielectric ("insulating layer" - "ceramic coating"; Figure 3,4; [0015],[0041]) material, extending in said longitudinal direction (width of 140/146; Figure 1) and for closing said first opening (142; Figure 1), a lateral end part of said elongate lid (418; Figure 4; [0041]) covering an end surface of said protruded end part (114; Figure 1) in said opening (142; Figure 1) location more forward in a direction from said first electrode body (406; Figure 4; [0041]), as claimed by claim 61

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 62-66, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes, Ferencz S. et al. (US 20030129107 A1) in view of Watabe; Masahiro (US 5500256 A). Denes is discussed above.

Denes further teaches:

- i. An electrode structure (Figure 4; [0041]) according to claim 62, wherein said first dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015],[0041]) case body (406+422+416; Figure 4; [0041]) and said second dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015],[0041]) case body (any other 406+422+416; Figure 4; [0041]) are integrally connected to one another, as claimed by claim 65
- ii. An electrode structure (Figure 4; [0041]) according to claim 62, wherein flow passage (408; Figure 4; [0041]) sectional area of said gas passage (408; Figure 4; [0041]) varies (at 422) along said gas passage direction , as claimed by claim 66 – horizontal 142 is shown as a smaller area than vertical 142.
- iii. An electrode structure (Figure 4; [0041]) according to claim 62, wherein said first dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015],[0041]) case body (406+422+416; Figure 4; [0041]) is provided with a gas uniformizing passage (408; Figure 4; [0041]) for dispersing said processing gas uniformly in said longitudinal direction (width of 140/146; Figure 1) and for introducing said processing gas into said gas passage (408; Figure 4; [0041]), as claimed by claim 69

Denes does not teach:

- i. An electrode structure (Figure 4; [0041]) according to claim 60, wherein said electrode structure (Figure 4; [0041]) further comprises an elongate dielectric (“insulating layer” -

“ceramic coating”; Figure 3,4; [0015]) *second case body* extending in said longitudinal direction (width of 140/146; Figure 1) and arranged in parallel with said first case body (406+422+416; Figure 4; [0041]) in said arranging direction (axis along 116; Figure 1), said second case body being formed a cross section orthogonal to said longitudinal direction (width of 140/146; Figure 1) into a U-shape (compare Applicant’s 57a; Figure 19 to U-shaped 416 into page) so that said second case body has a second opening which is opened toward an opposite side of said open direction, said gas passage being defined between said first and second case bodies, said second electrode body being, received in said second case body so that said second plasma generating surface is contacted with an inner peripheral surface of said second case body, an end part on a side of said second opening of said second case body being protruded in said opposite side of said open direction relative to said second electrode body, as claimed by claim 62

- ii. An electrode structure (Figure 4; [0041]) according to claim 62, wherein said first dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015],[0041]) case body (406+422+416; Figure 4; [0041]) and said second dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015],[0041]) case body (any other 406+422+416; Figure 4; [0041]) are separately formed, as claimed by claim 63
- iii. An electrode structure (Figure 4; [0041]) according to claim 63, wherein said first dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015],[0041]) case body (406+422+416; Figure 4; [0041]) has an opposing surface abutted with said second dielectric (“insulating layer” - “ceramic coating”; Figure 3,4; [0015],[0041]) case body

(any other 406+422+416; Figure 4; [0041]), and said opposing surface is provided with a recess to serve as said gas passage (408; Figure 4; [0041]), as claimed by claim 64

Watabe teaches an electrode plasma apparatus (Figure 3) including unmixed gas injection plenums (1x-3x; Figure 4A,B; column 5; lines 18-44; column 1; lines 65-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to reproduce and/or make separable Denes's electrode structure (Figure 4; [0041]).

Motivation to reproduce and/or make separable Denes's electrode structure (Figure 4; [0041]) is for introducing unmixed and unreacted gases into processing as taught by Watabe (column 2; lines 61-67). It is well established that the duplication of parts is obvious (In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04). Further, it has been held that it is obvious to make whole elements separable (In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961) – MPEP 2144.04

10. Claims 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes, Ferencz S. et al. (US 20030129107 A1) and Watabe; Masahiro (US 5500256 A) in view of Anders; Andre et al. (US 6137231 A). Denes and Watabe are discussed above. Denes and Watabe do not teach:

- i. An electrode structure (Figure 4; [0041]) according to claim 62, wherein Dene's first dielectric ("insulating layer" - "ceramic coating"; Figure 3,4; [0015],[0041]) case body (406+422+416; Figure 4; [0041]) has a plate (138; Figure 3; [0033]) defining said gas passage (408; Figure 4; [0041]), and a thickness of said plate varies along said gas passage direction (408; Figure 4; [0041]), as claimed by claim 67

- ii. An electrode structure (Figure 4; [0041]) according to claim 62, wherein a distance between said first electrode body (406; Figure 4; [0041]) and said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires "separation") varies along said gas passage direction of gas flow in said gas passage direction (408; Figure 4; [0041]), as claimed by claim 68

Anders teaches a similar plasma source array (Figure 9). Specifically, Anders teaches a thickness of said plate/electrode (164/162; Figure 9) varies along a direction of gas flow in said gas passage (from 160 to outside of the structure; Figure 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to dimension Denes's plate/electrode such that a thickness/distance varies along a direction of gas flow in said gas passage.

Motivation to dimension Denes's plate/electrode such that a thickness/distance varies along a direction of gas flow in said gas passage is for forming high quality films resulting from a "constriction" (column 4, lines 54-67; column 3, lines 1-13).

Response to Arguments

11. Applicant's arguments filed November 8, 2007 have been fully considered but they are not persuasive.

Conclusion

12. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435



11/1/8